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DEC 8, 2002

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COMMUNITY



**important
advancements in
cardiac
care**



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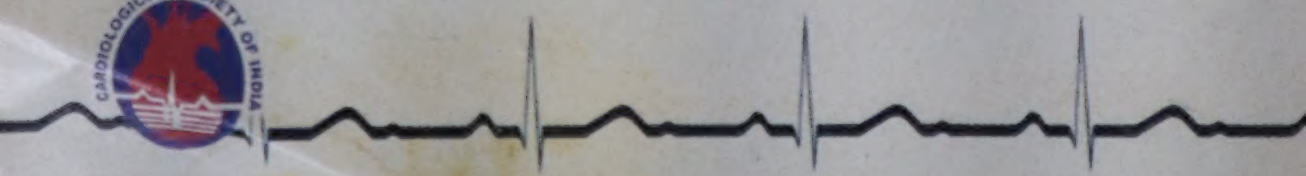
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Introduction

The national conference of the Cardiological Society of India is a scientific event where national and international experts give lectures on the most recent advancements in cardiology. Day-to-day problems faced by practising cardiologists will also be discussed and solutions suggested. As the largest and most important professional body of cardiologists in India, the society's aim is to improve the knowledge base of its members and thus, improve patient care. The conference provides cardiologists an opportunity to update their knowledge, which translates into better patient care, better patient survival and improved cardiac care.

The society's special committees give recommendations and guidelines to cardiologists on management of various cardiac problems so that patient care is uniform and scientific. Thanks to faster technology transfer, what is available in the West is available in India, too. But most of the modern developments in cardiology are technology-driven and, hence, very expensive for most Indians.

The society comes out with a bi-monthly *Indian Heart Journal* that covers the latest in cardiology. It is also a forum for Indian cardiologists to publish their research works. Outstanding researchers are awarded at the annual conference. However, lack of funds and technological facilities have been hampering research in India.

The society has subspecialty committees besides local chapters for every state. The Kerala chapter, which is organising the 54th annual conference of the Cardiological Society of India, holds two public awareness programmes every year coinciding with its local conferences. These provide an opportunity for the common man to clear his doubts on cardiac care.

Dr R.J. Manjuran,
president elect,
Cardiological Society of
India, organising
secretary, 54th Annual
Conference of the
Cardiological Society of
India, Kochi, 2002.



Know your heart

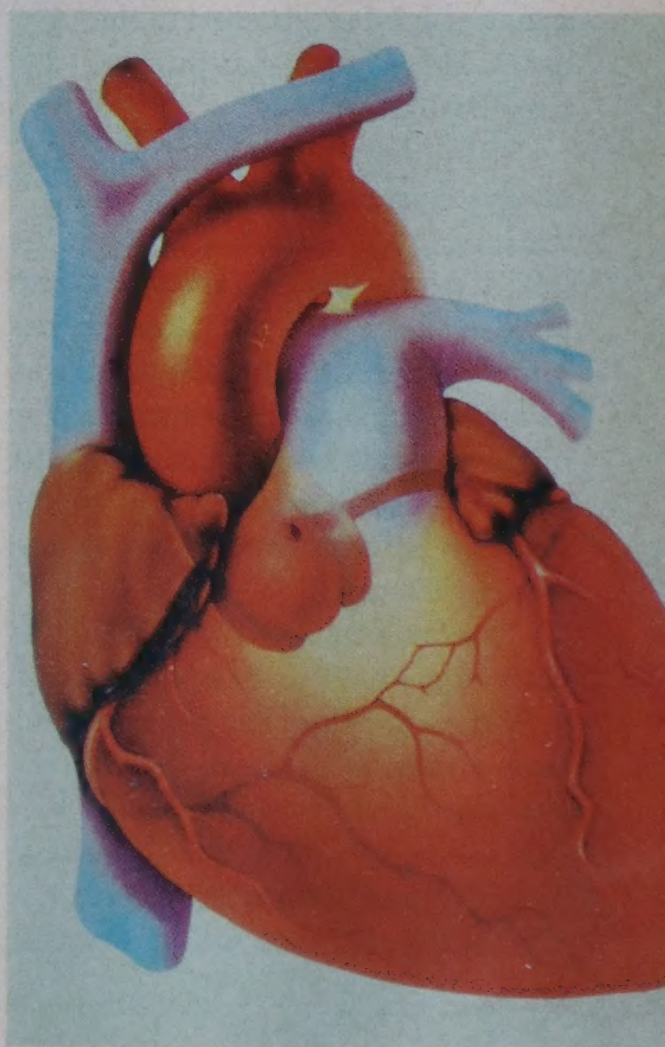
The heart is situated in the middle of the chest, with more of it on the left side.

Structure and functioning

The heart is divided into four main chambers: each one is a bag of muscles with walls that are able to contract in order to push blood out. Each wall's thickness varies according to the amount of work it does. The walls of the left ventricle are the thickest because it does most of the pumping.

The chambers on either side of the heart are arranged in pairs. Each side has an atrium, with thin walls, to receive blood from the veins. The atrium pumps blood into a thicker-walled ventricle, through which the blood is pumped into a main artery.

The heart is involved in two separate circulatory functions. Oxygen-rich blood is pumped from the heart into the body through the aorta. This



is called systemic circulation. When this blood is returned to the heart, after the cells have absorbed all the oxygen and nutrients, the heart pumps the blood into the lungs through the pulmonary artery. Here, the oxygen supply is replenished and the blood is returned to the heart. This is known as pulmonary circulation.

Pulmonary veins bring the newly-oxygenated blood from the lungs to the heart. It reaches the left atrium, which contracts and pushes the blood out through the mitral valve into the left ventricle. Then the left ventricle contracts. The blood moves through the open aortic valve into the aorta, and on to the system of arteries and capillaries, and into the tissues.

The deoxygenated blood from the body comes back to the heart through a large vein called the inferior vena cava, and from the head through the superior vena cava. The blood goes into the right atrium, via the tricuspid valve, and into the right ventricle. The ventricular contraction sends the



A pacemaker which was used 40 years ago

blood through the pulmonic valve into the pulmonary artery, and then to the lungs. From here, the blood comes into the pulmonary veins. And the process repeats itself, about 50-60 times a minute.

Control system

The two atria contract together and fill the ventricles with blood. Then both the ventricles contract together. This is controlled by an electrical timing system located in the right atrium: the sino-atrial node. The atrioventricular node delays the electrical impulse so that the ventricles contract only after the atria.

Common heart problems and their treatment

Disease/Problem	Causes	Symptoms	Treatment
Coronary artery disease	Hardening or blocking of coronary arteries with fatty deposits	Angina pain. May cause a heart attack or failure	Drugs or surgery to improve blood supply and ease pain. Diuretics to remove excess fluid from lungs and tissues
Heart failure	A result of almost any heart disease	Breathlessness on exertion due to fluid in lungs. Swelling of ankles	Diuretics. Surgery may be necessary if other problems, like valve disease, exist
Valve disease	Sometimes caused by rheumatic fever. Could be congenital	Same as heart failure. Angina as the heart wall thickens. Fainting when there is insufficient blood in circulation. Mitral valve problems cause palpitations	Surgery when symptoms are really bad. Otherwise, can be contained by medication. Aortic-stenosis (blocked outlet valve) needs surgery
Cardiomyopathy			
1) Congestive	Cause often unknown; can be caused by alcohol, metal poisoning and hormonal conditions	Heart failure, heart block, and palpitations. Leaky valves	Medication, and a pacemaker, if necessary
2) Hypertrophic	Cause unknown; may run in families	Angina and occasional fainting due to obstruction of blood flow from left ventricle	Drugs may relieve obstruction. Sometimes, an operation may be needed
Palpitations	Anxiety and hyperactive thyroid. Abnormalities in heart structure. May occur after heart attacks	Rapid heartbeat with dizziness or fainting due to insufficient blood supply to the brain	Drugs to suppress abnormal heart rhythm
Heart block (very slow heartbeat)	Either a degenerative disease or as a result of heart attack	Dizziness and fainting	Pacemaker



Intensive care

Intensive care was introduced in the sixties. This made it possible for specialised staff to monitor and measure vital parameters continuously. With the introduction of cardiac intensive care there has been a drastic reduction in mortality and morbidity in cases of heart attacks and cardiac failure.

Intensive cardiac care units in hospitals offer the right conditions for a patient brought in with fatal complications. These units have nurses and doctors round the clock attending to the patient. Every patient is connected to an ECG machine by electrodes to enable the staff to monitor blood pressure and heartbeat.

Another advancement in the field of intensive care has been the development of defibrillators. These are lifesaving instruments which convert dangerous heart irregularities to normal by applying a small electric shock.

While in the intensive care, the emphasis is on trying to save as many heart muscles as possible. But once the patient is out of danger, the doctor shifts the focus to rehabilitation. While rest is important, it is also important to slowly resume physical activity. Besides the cardiologist, a dietician and a physiotherapist would chalk out a programme to bring the patient back to normal.





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Non-invasive diagnostic methods

Stress Electrocardiography (ECG)

ECG or electrocardiogram has become a part of every cardiac evaluation. First developed in 1903, it traces on paper the pattern of heartbeats conveyed by electrodes placed on the patient's chest. Since a normal ECG at rest may not always show coronary artery disease, it is necessary to examine the adequacy of blood flow during times of increased need, say, in times of physical exertion. For this, the patient's ECG is done while he walks on a treadmill.

An ECG (right) shows the following wave forms:

P wave, PR interval, QRS interval, ST segment, T wave.

While the P wave represents the beginning of a

cardiac cycle, the QRS interval shows the electrical activity of the ventricles. Next is the ST segment. The T wave marks the end of a cardiac cycle, where the electrical charge changes and the heart gets ready for another cycle.

A treadmill ECG test can be used to identify high-risk and low-risk patients. It is especially useful in identifying heart disease in people who have normal ECG at rest but have had



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chest pain or may not have experienced any symptom at all.

As a tool to detect coronary artery disease, exercise ECG is, however, less accurate in women than in men. One reason for this gender discrimination could be the differences in disease prevalence in men and women.

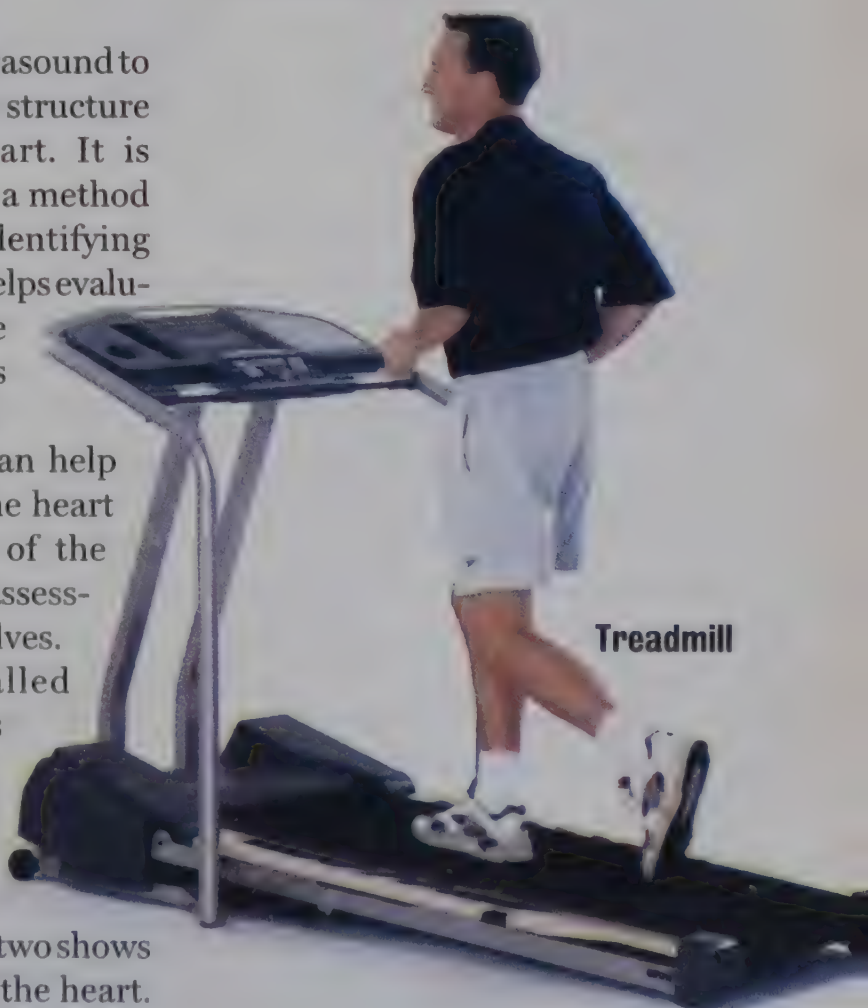
Echocardiography

Echocardiography uses ultrasound to provide an insight into the structure and functions of the heart. It is complementary to ECG as a method of evaluation. Used in identifying coronary artery disease, it helps evaluate the extent of the disease by measuring the thickness of the left ventricular wall.

An ultrasound exam can help us see blood flow across the heart valves and the structure of the valves. It is also useful in assessing the condition of the valves.

In a process called dobutamine stress echocardiography, the doctor measures the thickening of the wall at rest and during induced stress. The difference between the two shows the contractile function of the heart.

The person is healthy if the difference is more. If less, the person may need treatment. Two new modalities—tissue harmonic imaging and anatomic M-mode—make the diagnosis more precise and less subjective. These modalities help measure the cut-off point between normalcy and an abnormal thickening of the wall.



Treadmill

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**Echocardiography**

Every patient may not need an angiogram, which is invasive and more expensive. So echocardiography is one way to assess the condition of the patient and determine if he is a candidate for conventional treatment.

Besides providing a wealth of information on the heart, the process is patient-friendly and requires no surgery or even an incision. Three-dimensional online imaging is the most recent breakthrough which makes spatial visualisation of the entire heart in real time possible.

Nuclear scans

Nuclear cardiology involves using radioactive tracers to assess the condi-

tion of coronary blood flow. The functioning of the heart at rest and during exertion can be studied effectively using this method. For imaging with a radioactive agent, say, Thallium, the patient is given injections during exercise and rest. Stress imaging starts within 5 minutes of the in-

jection. Two common procedures are planar imaging and single-photon emission computed tomography (SPECT).

Adequate count density, proper patient positioning and proper display of images is important to produce good quality images. It is important that the patients remain still during the process. Tomography basically involves the three-dimensional reconstructing of planar images.

Magnetic resonance imaging (MRI)

MRI of the heart and blood vessels is under development. Excellent life-like pictures of the heart and its structures are possible with an MRI.





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Catheterisation

Cardiac catheterisation was first attempted by Frosmann in 1929 on himself. This is a process by which a thin long tube is introduced into the heart chambers through a vein in the arm or leg. Done for the right and left heart, catheterisation is basically performed to study the conditions in the chambers and vessels of the heart.

The procedure is performed in a cardiac catheterisation lab. Before performing catheterisation the cardiologist should fully explain the risks and advantages of the procedure. Preparing for the procedure includes preparing the patient's history, a physical examination, a complete blood test and ECG. Patient is told to fast before the procedure. Sedation is usually administered.

Catheters

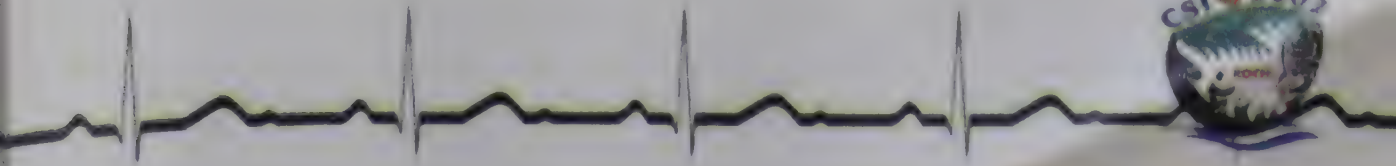
Catheters are thin, long tubes that come in different lengths and shapes.

A typical catheter measures between 50 cm and 125 cm; a 100 cm catheter is most commonly used for a left heart catheterisation in an adult. The outer diameter of a catheter is measured in French units—one French unit (F) is equal to 0.33 mm. Though larger 7F or 8F catheters are easy to manipulate and visualise, smaller ones—5F or 6F—are easy to remove after the process is over. However, advances in technology has made using smaller catheters possible in routine angiography with good results.

The most widely used catheter is the balloon flotation catheter, which has a small balloon at the tip. This is also considered the safest and the easiest to obtain blood samples.

Benefits of this procedure

- ❖ It is almost painless and can be performed without general anaesthesia.



Cardiac catheterisation

Catheter is introduced through an incision over a blood vessel into the heart.

Catheter may be introduced through a vessel in the leg.

Superior venacava

Right ventricle

Right atrium

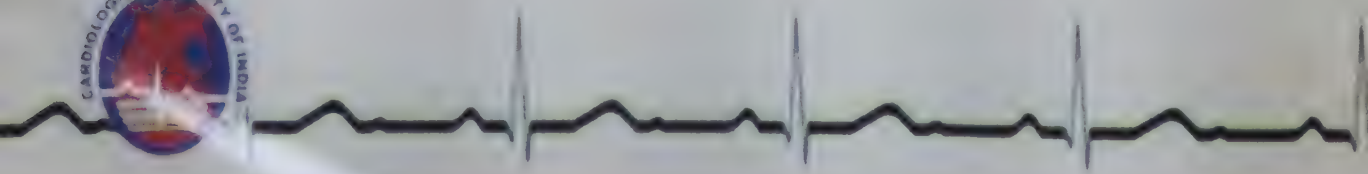
Inferior venacava

- ❖ Direct measurements of the pressures and oxygen levels in the various chambers in the heart can be obtained.
- ❖ Cine films can be obtained by injecting radio-opaque dyes through the catheter. This is used for studying normal and abnorm-

al blood flow patterns.

Complications

The most common complication is arrhythmia or loss of rhythm of the heart. Some major complications are pulmonary infarction, arterial or ventricular perforation and infection.





Drugs

In addition to the benefits obtained from intensive care, a number of drugs have made a foray into the treatment of heart attacks. These are drugs that help dissolve clots in the coronary arteries ('clot busters'), aspirin and similar drugs which prevent blood clotting, and beta blockers and ACE inhibitors that restrict the extent of the damage to heart muscles. These drugs not only provide immediate benefit, but prevent long-term complications.

There are three categories of drugs used in the management of angina pectoris—nitrates, beta blockers and calcium channel blockers.

Nitrates

Nitrates help relax vascular muscle. These are usually taken under the tongue or sprayed in the mouth for quick relief from symptoms such as pressure in the heart, radiating pain

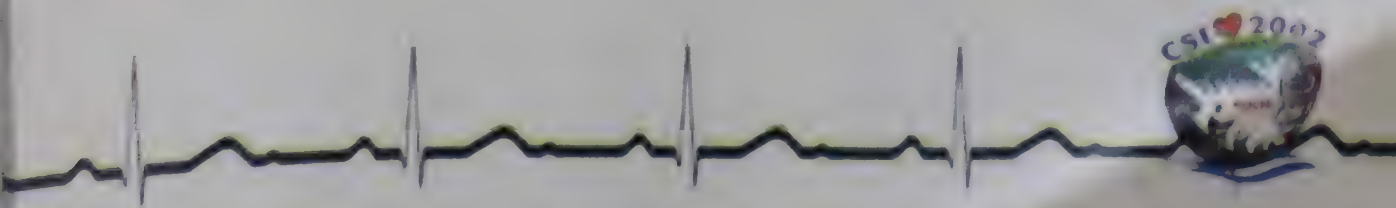
in the chest, pain in the back and teeth.

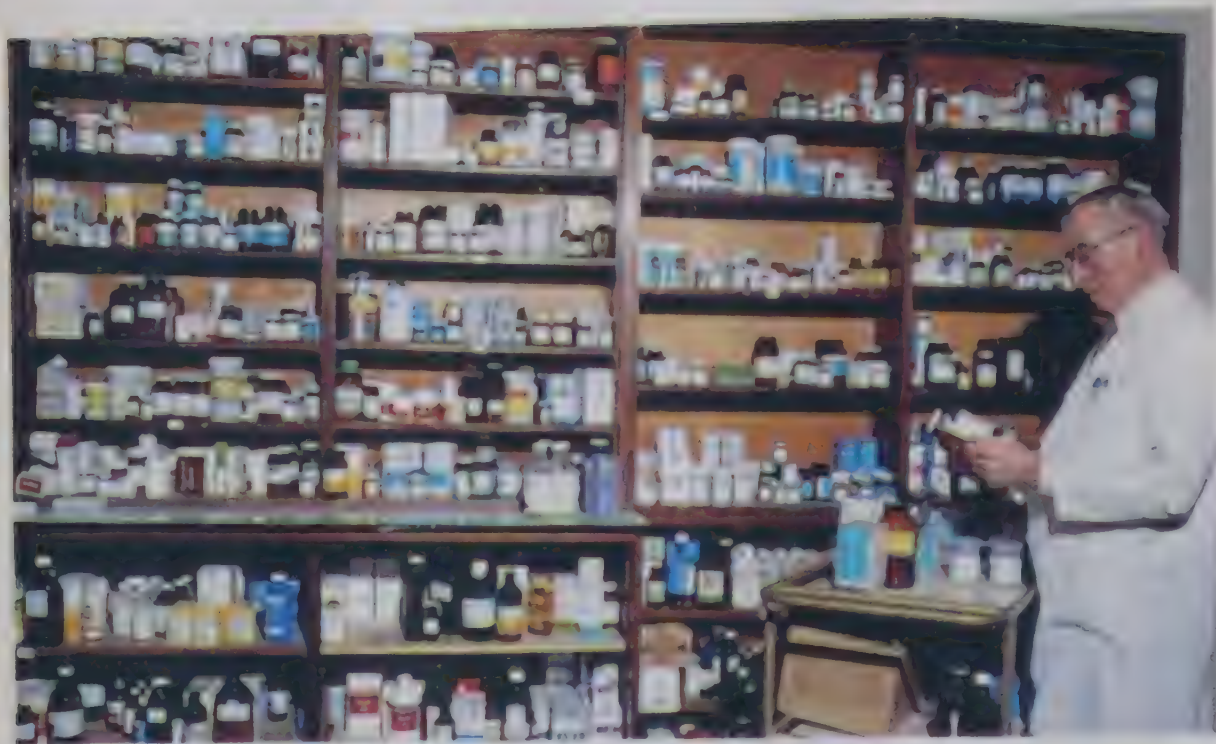
Beta blockers

Beta blockers effectively treat angina by decreasing blood pressure and heart rate from 'normal' to around 50-60. However, these have some side-effects. Beta blockers have been found to lower good cholesterol and also cause asthma. Though there are other side-effects like depression, hair loss, pain in the legs, fatigue and nightmares, it is important that the patient takes it without a break. An abrupt break can cause the symptoms to recur.

Aspirin

Though aspirin was created by a German chemist at the end of the 19th century to ease the pain of arthritis, since the early 1980s it has been approved for preventing second heart





attack and stroke. Now it is increasingly being used in treating heart attacks as they occur. Aspirin works by interfering with the synthesis of prostaglandins, which help control the body's response to injuries and infections. Prostaglandins act on the nervous system to help transmit pain. They signal blood platelets to form clots and also promote inflammation. But blood clots can cause heart attacks and inflammation is a likely culprit in atherosclerosis. Aspirin prevents blood clots and inflammation.

ACE inhibitors are angiotensin

converting enzyme inhibitors that dilate arteries. Drugs in this category are also beneficial to patients with leaky valves.

Statins

These are wonder drugs used to decrease cholesterol level in the blood. Statins reduce the thickness of the plaque, thus increasing the lumen of the blood vessel. These drugs are probably as good as angioplasty in treating angina. Some of the statins in the market are Simvastatin, Atorvastatin and Pravastatin.



Interventional cardiology

In some cases of coronary artery disease medications alone may not be enough to remove the arterial obstructions. While cases of blocked artery were treated first with medicines and then surgery earlier, today there are various options such as angioplasty and stenting which have several advantages over conventional surgery.

The first balloon angioplasty performed in 1964 was a failure and did not have many takers. It became popular after it was performed successfully in Switzerland in 1977.

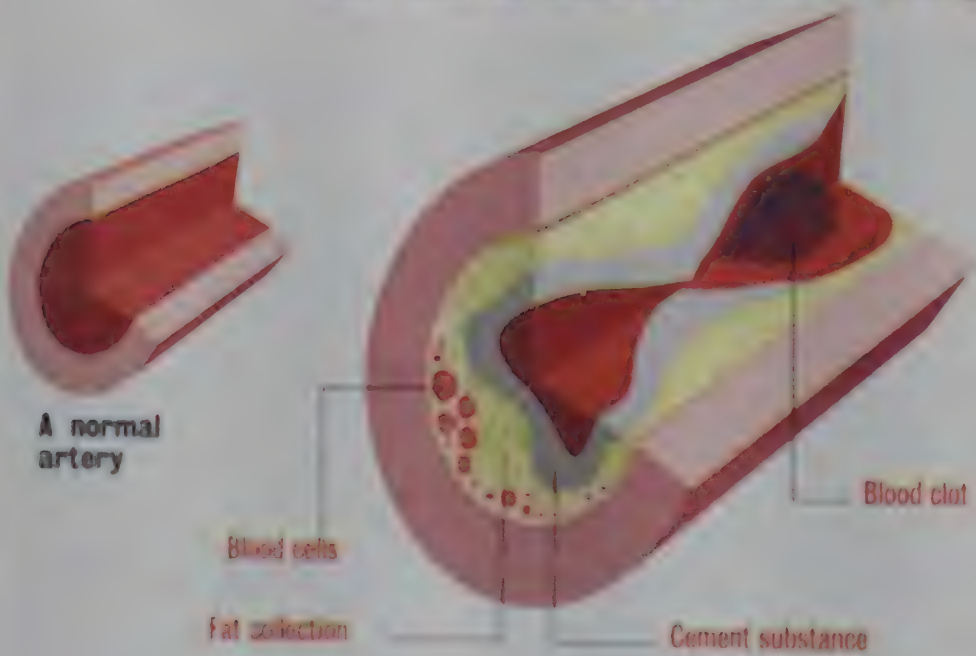
Known as percutaneous transluminal coronary angioplasty in medical parlance, balloon angioplasty takes around two hours and is very similar to an angiogram. Performed in a catheterisation lab, it is done

under local anaesthesia. The doctor makes a tiny incision over an artery, usually in the thigh, to thread the catheter in. X-ray imaging helps the doctor keep track of the catheter. Once it reaches the site of the plaque the balloon is inflated, for a few seconds or a few minutes depending on the requirement, to flatten the plaque and open the passage.

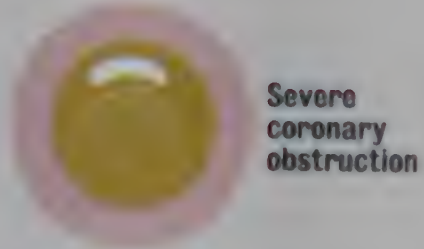
Some patients experience chest pain when the balloon is inflated. This is because the inflated balloon interrupts blood flow in the artery. The catheter is then withdrawn and the doctor takes X-ray pictures to assess the success of the procedure. The patient is taken to the cardiac intensive care unit after the procedure and can leave the hospital in a day or two.



An atherosclerotic artery



Fixed obstruction



Occlusive
blood clot



Blood clot
occluding partly



Severe
atherosclerosis



Stenting

Angioplasty has a high success rate, but there are cases where the plaque returns and the artery becomes narrow again. This is called restenosis. Scaffoldings called 'stents' have been developed to prevent the vessel from closing again.

The initial steps are similar to catheterisation where a small incision is made over an artery to insert the catheter. A stent, usually made of stainless steel, is first mounted on the deflated balloon on the catheter tube. When it reaches the site of the plaque the balloon is inflated. This expands the stent. The balloon is then deflated and removed, leaving the stent fixed in the plaque-affected area of the artery. Stents have been found to be useful in emergency situations and also in reducing restenosis.

Other angioplastic techniques

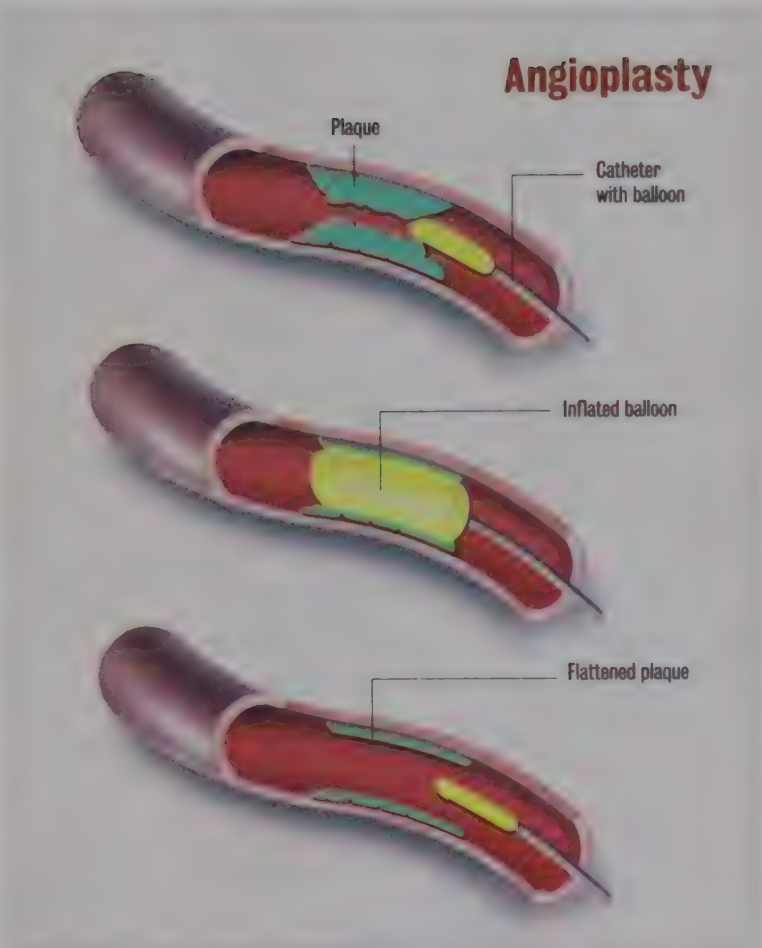
- ❖ Rotational atherectomy

- ❖ Directional atherectomy
- ❖ Laser angioplasty

Atherectomy is a process where a catheter with a rotor blade is used to remove plaque.

In Laser angioplasty, the doctor uses a Laser catheter to vapourise the plaque.

It is a remarkable achievement



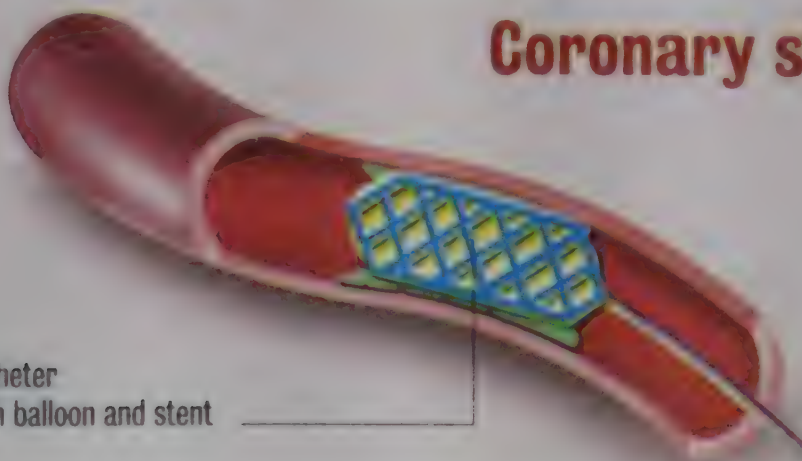
that narrow valves can be opened using similar techniques, without surgery. The other successful interventions have been the closure of holes in the heart using devices delivered through catheters. A hole in the heart is a congenital defect and an infant born with such a defect is called a blue baby. Holes in the heart allow impure blood to flow into the body. Holes can be between the left and right atria or the left and right ventricles. In some cases the defect may be in the openings to the chambers. It can also be a case of pure blood mixing with impure blood flowing through the major vessels of the heart.

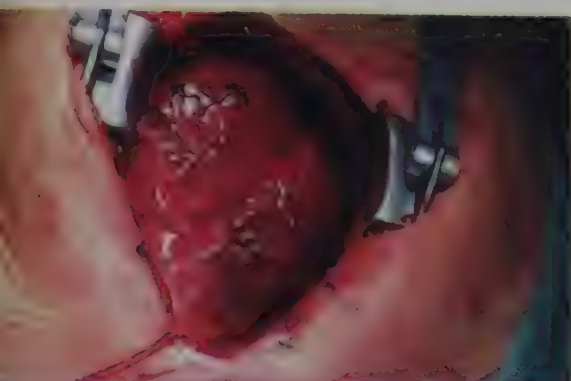
Symptoms of a congenital defect include inability to cry or swallow, blue colour and clubbing of finger nails. An X-ray, an ECG and other noninvasive tests can show the defect in the heart. The doctor then decides a treatment based on the test results.

Treatment often consists of surgery, which can be performed even on a newborn. However, in some cases the hole may close on its own as the child grows. A hole between the left and right ventricle is a condition which commonly requires surgery. The hole is either sewn up. If the hole is too large, a plastic patch is used to close it.

Coronary stent

Catheter
with balloon and stent





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Surgery

Heart transplant

Heart transplant was a milestone in cardiology and Dr Christian Barnard, a South African surgeon, was the first to perform a successful transplant on a human being in 1967. Candidates for a transplant are, of course, patients so sick with heart disease that only a healthy donor's heart can save them. People with other general diseases such as diabetes are advised not to go in for the surgery because such conditions could hamper recovery.

The introduction of open heart surgery in the fifties was a landmark in cardiology. Surgery has made repairing defects of heart valves and congenital abnormalities possible. Advanced techniques currently available also make it possible to operate on babies from day one.

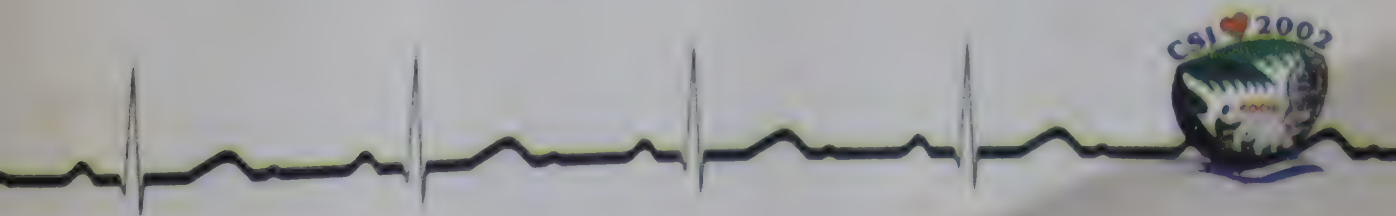
Coronary artery bypass surgery

Coronary artery bypass surgery was

first performed in 1964. A procedure where the blocks in the coronary artery are bypassed using another blood vessel, it is an alternative for people who do not get relief from medications or angioplasty. This has been useful for some patients with angina.

The technique involves taking a blood vessel from the leg or the chest and attaching it in such a way that it bypasses the blocked coronary artery. The blocked vessel is not replaced. The number of graftings a patient needs depends on how many of his coronary arteries are blocked.

Surgery requires cutting the breast bone from top to bottom to expose the cardiac region and the heart. The temperature is brought down to make the heart stop beating so that surgeons can operate on it. So during surgery, the patient is connected to a heart-lung machine where blood gets oxygenated and returns to





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A heart surgery in progress

the aorta to be circulated in the body.

The surgery may go on for three hours after which the patient remains in the intensive care unit for a few days. During this time, he may have a tube going down his larynx to ensure proper ventilation and a catheter to drain his urine. Medicines may be administered intravenously.

The patient starts feeling relaxed and well a day or two after the operation. However, pain in the operated area may persist for some time. Patient is encouraged to take a few steps two days after surgery but not allowed to sit for a long time to avoid swelling in the legs.

Complications—infection, heart attack, stroke and death—are rare. However, many experience a tempo-

rary decrease in thinking capacity and have problems with vision. Women seem to be at greater risk during surgery and seem to benefit less from bypass.

Beating heart surgery

Pioneered in 1965 by Russian cardiac surgeon Vassily Ivanovich Kole-

ssov, beating heart surgery was considered too radical then. It was revived in the 90s and has proved to be as durable as conventional bypass. Nearly one-quarter of all bypass surgeries in the US are off-pump.

In a beating heart bypass, surgeons stabilise a small area of the heart and place the bypass graft while rest of the heart continues to beat normally. Advantages are that the patient requires to spend fewer hours on a ventilator and fewer days in the intensive care unit.

Since the surgery does not use the heart-lung machine, advocates of the off-pump procedure believe that it has lesser side-effects and can be performed even on elderly patients with lung and kidney disorders.



Treating heart failure

The main focus of the doctor when faced with a patient suffering from heart failure is on how to alleviate the patient's suffering as well as to prolong his life.

One major treatment for chronic congestive heart failure patients is the use of diuretics—substances which help to get rid of water and salt from the body (by frequent urination). But this could upset the body's mineral balance and hence patients undergoing this treatment have to frequently go in for laboratory tests to check their magnesium and potassium levels. They also have to monitor their mineral intake.

Digitalis is another drug which has been found to be effective in patients who suffer from weakened heart muscle function as well as congestive

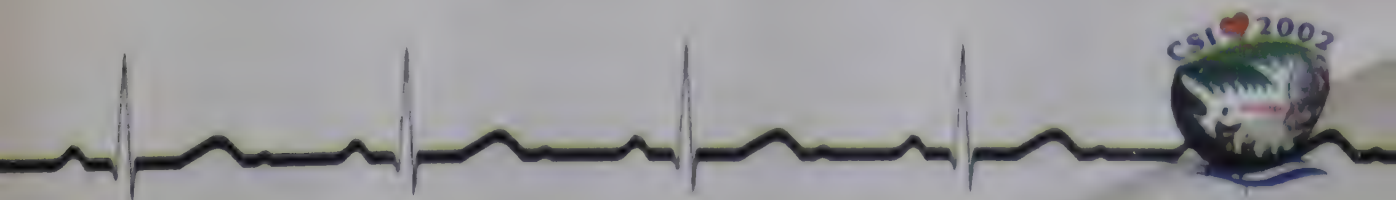
heart failure.

Nitrovasodilators like Isordil dilate the venous system and help reduce symptoms as well as prolong the life of the patients.

ACE (angiotensin converting enzyme) inhibitors dilate the arterial system and is seen to benefit those who suffer from leaky aortic and mitral valves. Doctors generally recommend this for those suffering from evident heart failure or even weakened heart muscle.

About 5 per cent of patients undergoing this treatment suffer from a dry hacking cough. In such situations doctors usually recommend stopping the use of ACE inhibitors.

Beta blockers is another kind of drug which has been found to be highly beneficial for patients with



chronic heart failure. Earlier it was believed to be dangerous for those with congestive heart failures. Even today nothing much is known about how exactly it works.

When acute congestive heart failure sets in more potent drugs may be required. This usually happens when there is a change in medication, slow or fast heart rhythm, infection, physical or emotional stress.

Sometimes drugs can prove to be ineffective in the treatment of heart problems, in which case a cardiac transplantation may be called for. The main drawback of this form of treatment is the non availability of heart donors and most often patients die due to the delay in heart transplant.

As with most drugs available on

the market, side-effects of some kind or the other are commonly experienced by patients consuming these drugs. It can vary from headache to asthma attacks and in some cases even cause heart rhythm disturbances. But when dealing with a serious health problem which could be fatal, certain risks have to be taken. More so when the drugs have been known to reduce mortality.

Another advancement has been the identification of the concept of diastolic heart failure which is a dysfunction of the relaxation phase of the heart beat. Treatment focused on this has provided considerable symptomatic relief.

Biventricular pacing could be very useful in the management of certain types of heart failures.



Life-saving gadgets

Abnormal increase, decrease or irregularities of the heart beat can be tackled by implantable devices like pacemakers and cardioverter-defibrillators. These are remarkable life-saving gadgets. They sense the dangerous irregularities and convert the rhythm back to normalcy.

Pacemakers have been in use since the late 1950s. It is an artificial, electrically charged device which can restore the rhythm of the heart. The basic function of this machine is to maintain regular, rhythmic heart beat, and prevent slow and irregular heart rates. It sends out electrical pulses to excite a wave of contraction in cardiac muscles when necessary.

The pacemaker consists of three basic parts—a container

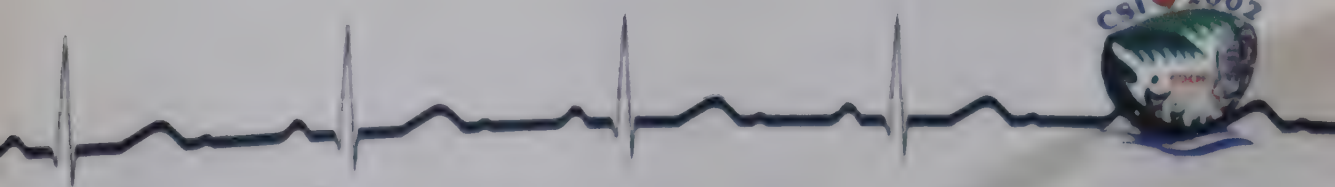
(pulse generator) with a battery and circuitry, insulated wires and metal electrodes. It gets activated only when there is a problem and otherwise allows the heart to function normally. Thus, if the user indulges in physical activity like walking or jogging, it automatically keeps pace with it and when asleep the rate decreases accordingly.

Cardiac pacemakers can be either temporary or permanent. Temporary ones can be pushed through a neck vein to the right ventricle and activated through an external generator during an emergency. In the other instance an entire pacemaker system is fixed inside the body for regular long-term use. Permanent pacemakers are of two kinds—single-

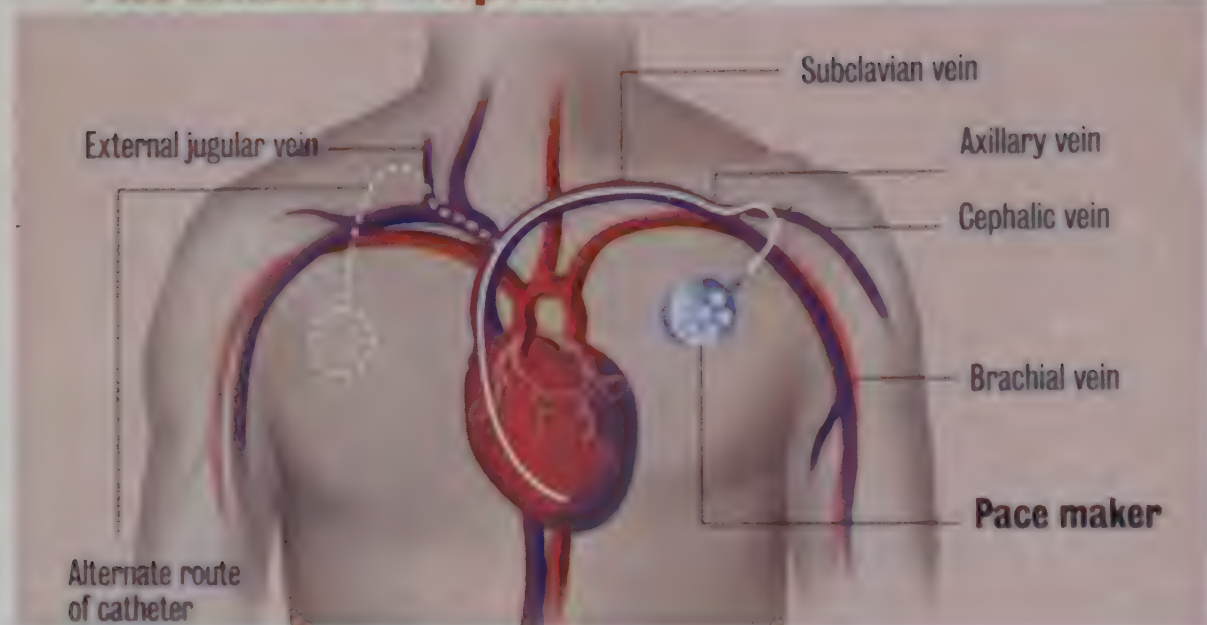


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Cardio-defibrillator



Pacemaker implant



chamber and dual-chamber.

Single-chamber devices stimulate the lower chambers of the heart alone, while the dual-chamber pacemakers stimulate first the upper chamber and then the lower chamber of the heart.

Pacemakers are not generally advised for patients with extreme debility, dementia, advanced cancer, and poor ventricular function.

Earlier, surgery required a hospital stay of about 7 to 8 days. But now patients can go home even the day after the surgery. They can soon resume an active life unless told specifically not to.

A simple way to find out if the

pacemaker is functioning normally is to regularly check your pulse rate. If it is above or below your normal pulse range, consult a doctor.

Cardioverter-defibrillators

Implantable cardioverter-defibrillators (ICD) are something like pacemakers and used for those suffering from a heart rhythm disturbance. Patients suffering from ventricular fibrillation—a terminal rhythm disturbance which is chaotic and, which could lead to sudden cardiac death and ventricular tachycardia with a rapid rhythm of over 100 beats per minute, are the



main beneficiaries of this treatment. A fatal rhythm disturbance can be caused due to a genetic defect or even intake of certain drugs.

The ICDs are made up of an electronic circuitry, power source, and memory with a microprocessor coordinating the various parts of the system. It continuously monitors the cardiac rate and delivers therapy when the rate exceeds the programmed 'cutoff' rate.

ICDs are implanted under sedation and local anaesthesia. Depending on the need, the patient may need to go in for a check-up every 3 or 6 months for the first 4 years, followed by more frequent follow-ups.

ICDs are fast turning out to be the new-age therapy for those at a risk of suddenly dying from a rhythm disturbance. Drugs have been found to be ineffective at times and sometimes even known to cause dangerous side-effects. The first human cardioverter-defibrillator implantation was in 1979. Now they are implanted by transvenous techniques and capable of multiple programmable therapies for various heart conditions.

ICDs constantly survey the heart's rhythm and also deliver shocks when

Symptoms that the pacemaker might be faulty

- ❖ Difficulty in breathing, dizziness or fainting spells
- ❖ Prolonged weakness or fatigue
- ❖ Swelling of the legs
- ❖ Chest pain or prolonged hiccoughing

Modern pacemakers rarely ever fail. The battery has a life of 8-10 years after which it has to be replaced.

required for rhythm realignment. They are often used when beta blockers don't work on people suffering from hypertrophic cardiomyopathy where the heart muscles thicken inappropriately. This disease does not have any regular symptoms other than shortness of breath, chest pain, fatigue, lightheadedness and fainting.

Compared to conventional treatments, ICD therapy has shown a significant improvement in overall survival. ICD is usually seen to benefit those who have already experienced a life-threatening rhythm disturbance and those who are at high risk for sudden cardiac deaths.





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Prevention

Current understanding of the cause of heart disease can be used to prevent it. The emphasis is on diet, exercise and quitting cigarette smoking. The treatment of blood lipid abnormalities, diabetes and high blood pressure have also assumed great importance in the prevention of heart disease.

Staying more active, avoiding flab around the middle and keeping your cool can go a long way in preventing heart disease. Age and gender (males are more prone) are unavoidable risk factors.

It is common knowledge that high cholesterol level is one reason for coronary artery disease. The effect is significant if the person is young. In the case of blood pressure, though the risk is present throughout life, regulating it can significantly reduce chances of heart disease. Smoking has been found to be a major cause of

heart disease. The more the number of cigarettes a man smokes, the higher is the risk. Though diabetes contributes to heart disease, women and younger diabetics are a greater risk.

However, controlling your blood cholesterol and pressure is possible through slight changes in diet and lifestyle. Include high fibre vegetables, beans and legumes and whole grains in your diet. A meal that contains fish, vegetables, olive oil and meat sparingly has been found to decrease the risk of cardiovascular diseases and even certain cancers. Avoid saturated fats—animal fats. They are the common culprits. Prevention, thus, requires one to switch to vegetable oils like corn oil or groundnut oil. The early you include unsaturated fats in your diet the better, because saturated fats also tend to contribute to obesity.

Try practising some relaxation



techniques such as meditation and *pranayama*.

If you have quit smoking, giving up caffeine won't be difficult. You need not give it up completely, but try reducing the intake. Caffeine increases blood pressure and heart rate.

There is also an increasing awareness about integrated medicine that incorporates more natural elements in the treatment of heart disease.

While conventional treatment involving drugs and surgery has its own benefits, adding natural elements in the regimen has been found to reduce the recurrence of symptoms and improve general well-being of the patient.

The natural elements include co-enzyme Q-10 that improves the function of mitochondria (the power house of the cell), and Omega-3 fatty acids

Keep your heart healthy

- ❖ Change your diet to include fruits and vegetables that are rich in antioxidants and fibre and whole grain breads. The earlier you shift to health foods the better.
- ❖ Take low fat or skimmed milk.
- ❖ Avoid fried and fast food.
- ❖ Maintain your body weight. Steer clear of flabs.
- ❖ If you smoke, quit rightaway.
- ❖ If you are addicted to coffee, try to cut down the number of cups.
- ❖ Avoid excess alcohol.
- ❖ Exercise regularly.
- ❖ Keep your blood pressure under control. If you require medication, take it regularly.
- ❖ Avoid emotional stress. Learn to relax.
- ❖ Take extra care to stick to a preventive regime if you have a family history of heart disease.
- ❖ You can prevent another attack or halt the progression of the disease if you can bring about a significant change in your lifestyle.



and magnesium that reduce rhythm disturbances of the heart. Antioxidants that help your body break free radicals are an essential part of the prescription. Some of the easily available antioxidants are vitamin C, vitamin E, beta-carotene, zinc, selenium, alpha lipoic acid, manganese and lycopenene.

Practitioners of integrated medicine usually recommend vitamin C and garlic along with antibiotics for bacterial infection of the heart valve.

Consult your physician and a nutritionist for diet and medication.

Bad and good fat

Avoid saturated fat like beef, pork, mutton, cream, cheese and palm oil.

Use olive oil and mono unsaturated fat.

Some antioxidants and their sources

Vitamin C: Citrus fruits, guava, strawberry, broccoli, tomatoes

Vitamin E: Lobster, corn oil, sunflower oil, peanut butter, almond

Beta-carotene: found in yellow, orange and dark green vegetables such as papaya, carrot, pumpkin, spinach, tomato

Selenium: garlic, grains, swordfish, tuna

Alpha lipoic acid: broccoli, cabbage, cauliflower, carrot

Stay fit

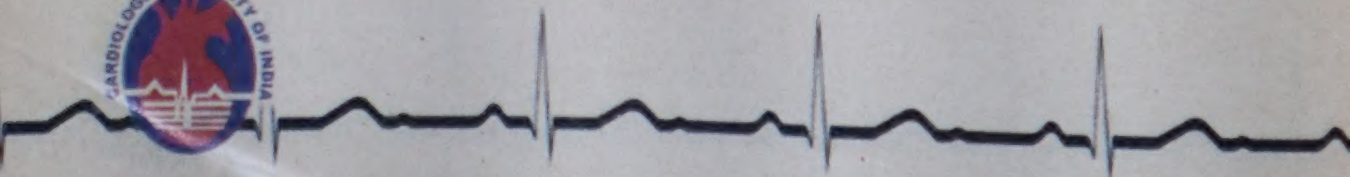
Exercise can help reduce high blood pressure, cholesterol and infuse a sense of well-being in the person.

- ❖ It reduces blood sugar and flab around the middle
- ❖ It increases insulin sensitivity
- ❖ Exercise also facilitates the nitric oxide metabolism in the endothelium
- ❖ Dynamic exercise helps develop endurance. These activities are jogging, walking, swimming and cycling.
- ❖ Static exercises such as weight lifting may not be advisable for a person who has been diagnosed with heart disease.

THE WEEK SUPPLEMENT

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HOW TO PREVENT HEART ATTACK

CHANGE IN FOOD & LIFE STYLE

Stop Smoking



EXERCISE REGULARLY

Walk continuously 45 mts. a day



REDUCE FATTY FOOD

Give up fried foods, animal meat,
egg-yolk and milk cream



TREAT AND CONTROL DISEASES LIKE DIABETES AND HIGH BLOOD PRESSURE PROPERLY

Wind down tensions



CONTROL BLOOD CHOLESTEROL

Through dieting & medicines if required



IF YOUR CLOSE RELATIVES HAVE HAD HEART DISEASE TAKE STRICT PRECAUTIONS

Get the advice of a specialist doctor if required



**54TH ANNUAL CONFERENCE OF
THE CARDIOLOGICAL SOCIETY OF INDIA**

1st - 4th December 2002, Kochi, Kerala

